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# THE MUSEUM MITE.

BY ANDREW MURRAY.[1]

THE *Tyroglyphus entomophagus* is the smallest of all the known species of this genus. It is remarkable for the parallelism of the sides, and cylindrical appearance of the body, and for its narrowness, especially in the female. Its legs are shorter than in the other species.

It is a species only too well known to entomologists. It takes up its abode in entomological collections, in the interior of the body, or on the surface of the insects, and in the dust which gathers at the bottom of the drawers or boxes. Large insects, with the body full of fatty particles, those which have been brought up in captivity, and which have not paired, and those which have *become greasy* (to use the technical expression), are the most liable to attack. Certain families of Coleoptera, the large *Scarabœidæ*, like *Oryctes* and *Geotrupes*, the *Lucanidæ*, the *Carabidæ*, the *Dytiscidæ*, and the *Hydrophilidæ*, the *Cerambycidæ*, the large or badly dried *Blaptidæ*, may often be seen covered on the surface with excrement and eggs, under the form of white dots, and sometimes contain a considerable number of these Tyroglyphi in the interior of the body.

The body of the large, especially the nocturnal Lepidoptera, the Cicadæ amongst the Hemiptera, the Earwigs, etc., have them likewise, and the quantity sometimes furnished by such insects, where the mites have once obtained a footing, is truly enormous.

The *Tyroglyphus entomophagus* may be found running upon the back of dead insects, and may be seen without the aid of the microscope. According to M. Perris it gnaws the down and the hairs of the insects attacked. It is, however, chiefly in the inside of their body that it lives; it gnaws and dilacerates all substances that are soft or deprived of chitine; hence they are specially destructive to Lepidopterous insects. In handling insects that have been attacked by these Tyroglyphi, we are apt to cause the articulated pieces of which the ligaments have been destroyed to fall asunder, and then there issues from the body a friable matter in which the living Acari swarm.

The friable matter which falls out, when the body of insects gnawed by the *Tyroglyphus entomophagus* is shaken, is composed first, of the excrement of these animals in the form of little roundish grayish masses; secondly, of the eggs in course of development, and of empty shells of hatched eggs, of open and bent shells, cracked often longitudinally; thirdly, of young larvæ and of nymphs, always more numerous than the adult animals; fourthly, of tegumentary envelopes proceeding from the moulting of a great number of larvæ and nymphs; fifthly, of visceral or muscular remains of the body, of pieces of tracheæ, of striated muscular fasciæ, of dried fragments, sometimes of eggs which have not been laid, and which have become loose in the body of the females of the attacked insects.

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[1] Extracted from Economic Entomology: Aptera. By Andrew Murray. London, 1877.

In the dust at the bottom of the boxes, amongst the remains of all kinds, antennæ, feet, palpi, broken or fallen, one sometimes finds the envelopes of Gamasus, of Glyciphagus, and of Cheyletus Acarids, which live also in collections. Upon the insects themselves, and devouring the excrements and the remains of the Tyroglyphus, M. Perris has found, at Mont-de-Marsan, the larvæ of the *Cecidomyia entomophila*. The walk of the Tyroglyphus entomophagus is slow. It walks with the head bent down, in such a way as to allow the ridge of contact of the two mandibles which go beyond the hairs of the nape of the neck to be seen in front. The males are as numerous as the females, and a little more agile.

It remains to say a few words as to the best means of keeping these mites out of collections, and of getting rid of them when they have once effected an entrance. The insects which are most liable to be attacked by the *Tyroglyphus entomophagus* are, as already said, those which have not been well dried, or which have been placed in ill fitting boxes in a damp room.

When the Tyroglyphus has attacked an insect, one perceives outside little whitish points on the bodies of those with smooth teguments, or on another kind a sort of grayish white powder mingled in the hairs of cottony or downy kinds. Soon under the insect invaded, or on the corresponding sides of the box, one notices a matter of a grayish pulverulent aspect, recalling the efflorescence of saline matters not deliquescent. This dust is said to be quite different from the organic pulverulent debris which results from the ravages of the Anthrenus or Dermestes; these latter produce a fine sawdust, blackish or brownish, but dry and non-adherent. Collections in the south of France, exposed to damp, are very rapidly attacked by Tyroglyphus entomophagus. The mouldiness which shows itself in a collection makes one suspicious of mites, for mould and mites almost always go together.

When an insect is known to be attacked by Tyroglyphus it is best to isolate it in a very dry box. If the insect is glossy the mites which have got into it should be removed with a fine camel-hair brush. If the insect is scarcely attacked, it can be replaced on condition of being watched. But very often one sees reappearing on the body of an insect which has been simply cleaned or brushed, new Tyroglyphi which come from within or from the cavities of the joints where they are apt to gather in large numbers. This shows that the cleansing has been insufficient. One can then have recourse to the heat of the stove or oven. This proceeding is inconvenient when the insect turns out to be what is technically called "greasy." Besides, although the Tyroglyphi may not resist the effect of a high temperature, the eggs often do, especially when they are situated in the interior of the body, and the mites swarm again soon after.

We can scarcely recommend pure water, for if the outside of the dirty insects is washed, it penetrates into the inside, leaving a humidity unfavorable to the object in view.

Alcohol is good for all the insects which can stand its action without being hurt in their colors, hairs, or scales. It will not do for Lepidoptera, but we have often placed beetles that are hard and polished in a flask with a large mouth without taking the trouble of cleaning them. The pin holding the insect is stuck into the under side of the cork, and the body soaks in alcohol without going to the bottom of the vessel. An immersion of several hours or a day is sufficient. Either simple alcohol, or alcohol containing a small solution of corrosive sublimate, will answer. After a bath of an hour in the latter, the insect should be washed in pure alcohol to carry off the sublimate, which, without this precaution, forms a whitish crust and corrodes the pins. We prefer to use alcohol with arsenic or saturated with strychnine, which, in ridding the insects from the Tyroglyphi, has the advantage of preserving them also against the Anthreni.

Besides alcohol, there are liquids which *scour* the insects perfectly, killing the Acarids and carrying off their favorite aliment. These very useful liquids are ether, benzine, essence of naphtha.

Dr. Leconte has utilized the "atomizer" for thoroughly and imperceptibly besprinkling the insects with such liquids.

MM. Grenier and Aubé devised an apparatus for exposing the insects without removal to the vapors of such chemicals. It is a large necrentôme of tin, with fastenings, made with a trench, to be filled with water, so as to submerge the edge of the cover, and is well adapted for museums and large collections, where the labor of individual cleaning would be too great. But so far as regards mites this is not necessary if the drawers or boxes only fit moderately closely. Then it will be found sufficient to expose a few crystals of pure naphthaline for an hour or two in the drawers. This is the simplest, easiest, and most effectual of all contrivances to destroy mites.

Where it is necessary to treat the insects in detail, another effective but more troublesome plan is to expose the infected insect to the vapor of liquid ammonia, by placing a morsel of sponge in a paint saucer and moistening it with a few drops of powerful liquid ammonia. The insect is placed on a bit of cork alongside of the sponge, and the whole covered by a tumbler or small bell-glass, so as to keep in the vapor; and in ten minutes or a quarter of an hour the cure is generally complete. Sometimes it must be repeated; but this is rarely necessary.

Insects should never be put away until they have been well dried, and, if necessary, freed from fatty visceral matters. This is particularly necessary for kinds brought up in captivity or full of juice at the moment of their capture.

## RECENT LITERATURE.

MURRAY'S ECONOMIC ENTOMOLOGY.[1] — While this work refers at length to such myriopods, spiders and Thysanura as in any way affect man, it is mainly devoted to the mites and ticks, and as such is the only recent and complete manual treating of these important animals which is accessible to the English student. The collections forming the basis of the work are in the Bethnal Green Branch of the South Kensington Museum, and must form a curious department of the museum. This collection is designed for the instruction of the people, and the specimens illustrative of insects injurious to vegetation, or obnoxious to man and the domestic animals, are openly exposed in cases along with colored figures of them, often more or less magnified according to the size of the insect, a practice particularly useful in such minute beings as the mites. Models of injuries done to perishable objects have also been added. It is doubtful, judging by the author's statements, whether there is any other museum either in Europe or America where such a mass of information regarding the habits of troublesome or injurious insects have been spread before the people.

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[1] *South Kensington Museum Science Handbooks. Branch Museum, Bethnal Green. Economic Entomology. Aptera.* By ANDREW MURRAY. Prepared at the Request of the Lords of the Committee of Council on Education, and Published for them by Chapman & Hall, 193 Piccadilly, London. 1877. 12mo, pp. 433.